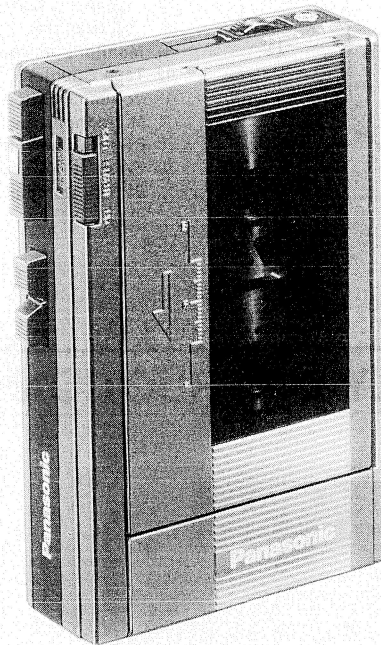


Service Manual

Mini Cassette Recorder

Mini Cassette
RQ-352
(Brown)
(Silver)



This is the Service Manual for the following areas.

- For all European areas except United Kingdom.
- ▢ For United Kingdom.
- For Asia, Latin America, Middle East and Africa areas.

The product to be marketed in Europe is brown type, and that to be marketed in other areas is silver type.

RQ-352 MECHANISM SERIES

Specifications

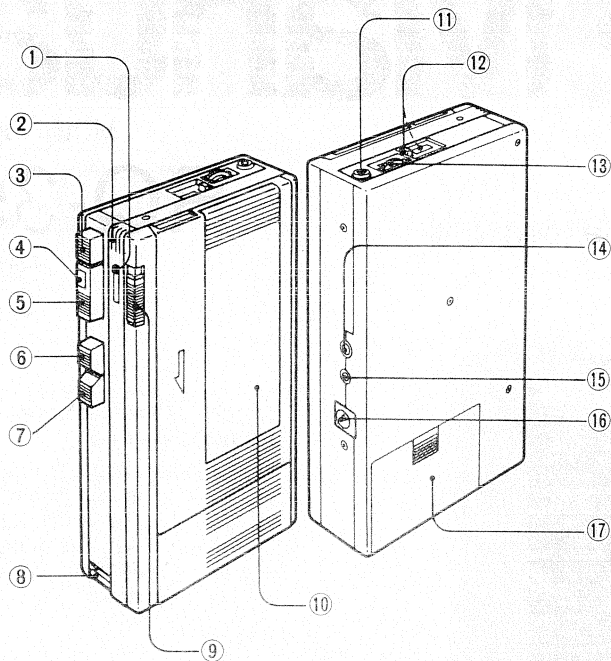
Power requirement:	Battery; 3V (Two R6 (UM-3) size dry batteries) [DB]...AC; with optional AC adaptor RP-31 [N] ...AC; with optional AC adaptor RP-34 Rechargeable battery; with optional rechargeable battery pack RP-009	Tape speed:	4.8cm/s
Power output:	500mW...RMS (max.)	Track system:	2-track monaural recording and playback
Frequency response:	200—8,000Hz	Fast forward and rewind time:	Approx. 140sec. with C-60 cassette tapes
Motor:	Electrical governor motor	Jacks:	Mic; sensitivity 0.25mV/applicable microphone impedance 200Ω—600Ω DC in; 3V Monitor; 8Ω
Wow and flutter:	Less than 0.48% (RMS)	Speaker:	4.5cm PM dynamic speaker
		Dimensions:	85mm (W)×134mm(H)×33mm(D)
		Weight:	340g, without batteries

Design and specifications are subject to change without notice.

National / Panasonic

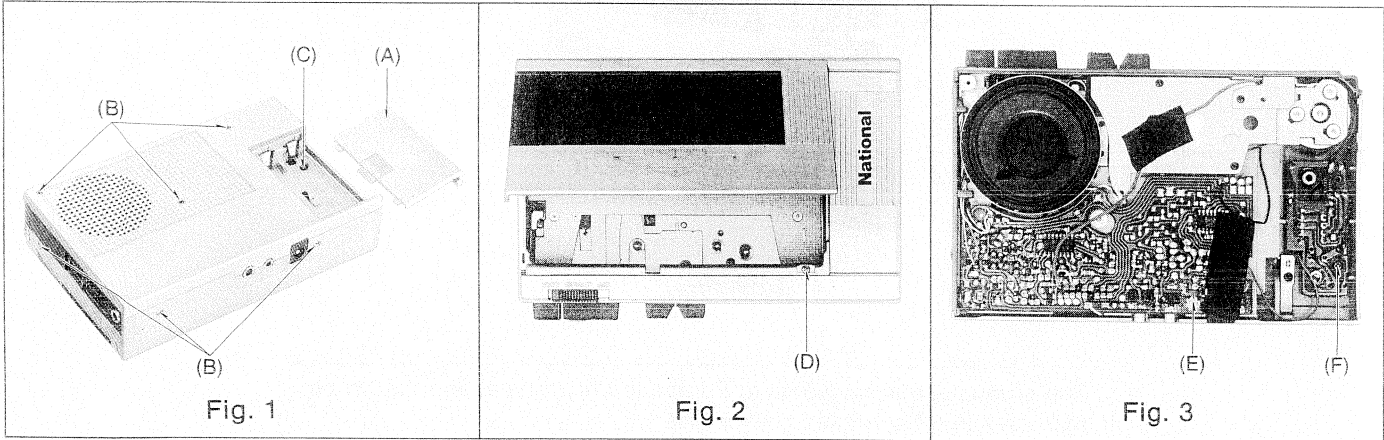
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

LOCATION OF CONTROLS AND COMPONENTS



- ① Recording Indicator/Battery Check Lamp [REC/BATT]
- ② Built-in Microphone
- ③ Stop/Eject Button [■ STOP/▲ EJECT]
- ④ Record Button [REC]
- ⑤ Play Button [▶ PLAY]
- ⑥ Rewind/Review Button [⏮ REW/REV]
- ⑦ Fast Forward/Cue Button [FF/CUE ⏭]
- ⑧ Hand Strap
- ⑨ Pause Control [⏸ PAUSE (OFF • LOCK)]
- ⑩ Cassette Compartment Cover
- ⑪ Monitor Jack [MONITOR (8Ω)]
- ⑫ Tape Counter and Reset Button
- ⑬ Volume Control [VOLUME]
- ⑭ Microphone Jack [MIC]
- ⑮ Remote-Control Connection Jack [REMOTE]
- ⑯ External Power Supply Input Jack [DC IN 3V (⊖ ⊕)]
- ⑰ Battery Compartment [⏴ OPEN BATT]

DISASSEMBLY INSTRUCTIONS

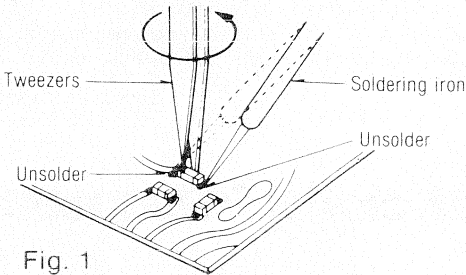


Ref. No.	Procedure	To remove —.	Remove —.	Shown in fig. —.
1	1	Bottom case assembly	• Battery lid(A) • 6 screws(B) • 1 black screw(C)	1
2	1 → 2	Main case assembly	• 1 screw(D)	2
3	1 → 2 → 3	Main circuit board and motor governor circuit board	• 1 screw(E) • 1 red screw(F)	3

CHIP PARTS REPAIR PROCEDURE
(transistor, diode, resistor and capacitor, etc.)

A. Removal

- 1. Remove all solder from both ends of chip using a solder sucker (RP8062) or desoldering wick.
- 2. While the chip is hot remove it by turning with tweezers as shown in fig. 1.
- * Make sure that the unit is turned OFF when checking the resistance and polarity of a chip.



B. Mounting

Place solder on the foil chip mounting, and solder the chip while applying the soldering iron in the direction of the arrow, as shown in the diagram (fig. 2).

C. Precautions in mounting the chip

1. Do not heat the chip beyond 3 seconds.
2. Do not rub the electrode.
3. Use tweezers to prevent any damage to the surface.
4. It is recommended that a pencil-type soldering iron be used.
5. Maintain temperature control under 260°C (500°F) when soldering.
 - * Chip resistance (of not more than 100Ω) may vary greatly with the direction of mounting; therefore, mount the white side on the pattern side.
6. Do not re-use the tantalum capacitors or ceramic capacitors after removal (use new components).
7. Do not subject the components (chips) to excessive stress.

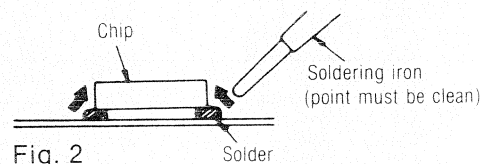
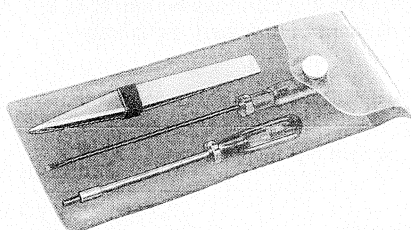


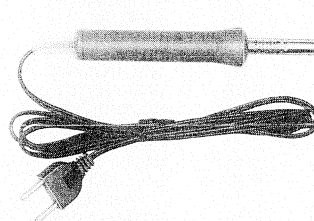
Fig. 2

INTRODUCE OF SPECIAL SERVICE TOOLS FOR CHIP PARTS

We herein introduce our special tools for the easy handling and accurate repair of chip parts. Since chip parts are extremely small, handling is very difficult during servicing and repair. (Refer to the Technical Information of order No. ARD82070183T9-01.)



TOOL KIT FOR CHIP PARTS
HM-357



SPECIAL SOLDERING IRON FOR CHIP PARTS
HM-354

MEASUREMENT AND ADJUSTMENT METHODS

NOTES: Keep good condition, set switch buttons and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature: 20±5°C (68±9°F)
- Volume control: Set to 8.

ITEM	MEASUREMENT & ADJUSTMENT
㊦ Tape speed accuracy adjustment Condition: * Playback mode Equipment: * Digital electronic counter or frequency counter * Test tape...QZZCWAT * Resistor (8Ω)	Tape speed accuracy 1. Test equipment connection is shown in fig. 1. 2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter. 3. Take measurement at middle section of test tape. 4. Measure this frequency. 5. On the basis of 3,000Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100 (\%) \quad \text{where, } f = \text{measured value}$ <div style="border: 1px solid black; padding: 5px; text-align: center;"> Standard value: ±2.5% (f = 2,925—3,075 Hz) </div> 6. If measured value is not within standard, adjust VR201 (shown in circuit boards and wiring connection diagram), so that frequency becomes 3,000Hz.
㊦ Adjusting the governor circuit (μ adjustment) Condition: * Playback mode	Checks after motor replacement 1. After replacing the motor, playback the test tape (QZZCWAT) and listen to the reproduced sound. If the sound vibrates or fluctuates, change the resistor (R204) to 1.5 ohms (ERD10TJ1R5). 2. Playback the test tape (QZZCWAT) and check that the reproduced sound does not fluctuate.

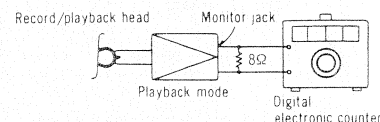


Fig. 1

ELECTRICAL PARTS LIST

NOTES: RESISTORS

ERDCarbon
ERGMetal-oxide
ERSMetal-oxide
EROMetal-film
ERXMetal-film
ERQFuse type metallic
ERCSolid
ERFCement

CAPACITORS

ECBACeramic
ECGCeramic
ECKCeramic
ECCCeramic

ECFCeramic
QCUTCeramic
ECQMPolyester film
ECQEPolyester film
ECQFPolypropylene
ECEElectrolytic
ECEONNon polar electrolytic
ECQSPolystyrene
ECSTantalum
QCSTantalum

CHIP RESISTORS

RRDCarbon

CHIP CAPACITORS

QCUDCeramic
ECSETantalum

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS			
R 2	RRD18XJ222	C 4	QCUT1H392MRL
R 3	RRD18XJ103	C 5	ECSF1CD224
R 4	RRD18XJ472	C 6	ECEA1HKS010
R 5	RRD18XJ102	C 7	ECEA0GKS470
R 6	RRD18XJ822	C 8	QCUT1H472MRL
R 7	RRD18XJ153	C 9	ECEA0GKS221
R 8	RRD18XJ472	C 10	ECEA0GKS101
R 9	RRD18XJ103	C 11, 12	ECEA1HKS010
R 10	RRD18XJ102	C 13	ECEA1HKS2R2
R 11	RRD18XJ103	C 14	ECEA1VK54R7
		C 15	ECEA0GKS470
R 12	RRD18XJ471	C 16	QCUT1E223MRL
R 13	RRD18XJ184	C 17	ECSF1CD224
R 14	RRD18XJ472	C 18	ECEA1HKS010
R 15	RRD18XJ474	C 19	ECSF1CD224
R 16	RRD18XJ223	C 20	QCUT1H102MRL
R 17	RRD18XJ562	C 21	ECEA0GKS221
R 18	RRD18XJ271	C 22	ECEA1HKS22
R 19	RRD18XJ560	C 23	ECEA0GKS330
R 20	RRD18XJ103	C 24, 25	ECEA1HKS2R2
R 21	RRD18XJ222	C 26, 27	ECEA1EK4R7
		C 28	QCUT1E104ZFM
R 22	RRD18XJ100	C 29	QCUT1H471MRL
R 23, 24	RRD18XJ561	C 31	ECEA0GKS101
R 27	RRD18XJ470	C 32	ECEA0GKS470
R 28	RRD18XJ821	C 33	QCUT1H101MRL
R 29, 30	RRD18XJ8R2	C 34	ECEA0GKS330
R 201	ERSB39JR30	C 35	ECEA0GKS221
R 202	ERSB20J103		
R 203	ERD10TJ102	C 201	ECEA1EK4R7
R 204	ERD10TJ1R5		
(Selectable)	ERD10TJ2R2		
CHIP JUMPERS			
JP 1, 2, 3, 4, 5	RRD18X000		
VARIABLE RESISTORS			
VR 1	EVLEAAT12A14 (With Screw)		
VR 201	EVNK4AA00B32		
CAPACITORS			
C 1	ECEA1HKS22		
C 2, 3	QCUT1H222MRL		
TRANSISTOR			
Q 201	2SB909M		
DIODES & RECTIFIER			
D 1	SM112		
LIGHT EMITTING DIODE			
LED 1	SLB22UR3		
INTEGRATED CIRCUITS			
IC 1	BA3410F		
IC 2	BA5208F		
IC 201	AN6612		

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description
SWITCHES		
S 1	QSS6222T	Leaf Switch (Record/Playback Selector)
S 2	QSB0302i	Leaf Switch (Power ON/OFF)
S 3	QSS1231	Slide Switch (Pause Control OFF/LOCK)
JACKS		
J 1	QJA0184	M3 Jack (MIC)
J 2	refer to G12	MONITOR Jack
J 3	QJA0177	DC IN Jack
J 4	QJA0185	M2 Jack (REMOTE)

NOTES:

- S1-1—S1-3Record/playback select switch (shown in playback position).
- S2Power ON/OFF switch (shown in OFF position).
- S3Pause control switch (shown in LOCK position).
- VR1Volume control.
- VR201Tape speed adjustment VR.
- Resistance are in ohms (Ω), 1/8 watt unless specified otherwise.
K = 1,000 Ω .
- Capacity are in microfarads (μ F) unless specified otherwise.
P = Pico-farads.
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.
One type of number is used for supply parts number and production parts number when they are identical.

e.g. Q1

2SC2412LN(R,S)——Production parts number
or 2SC2405(S,T)

[2SC2412R]——Supply parts number

D2

1SR35200——Production parts number

[SM112]——Supply parts number

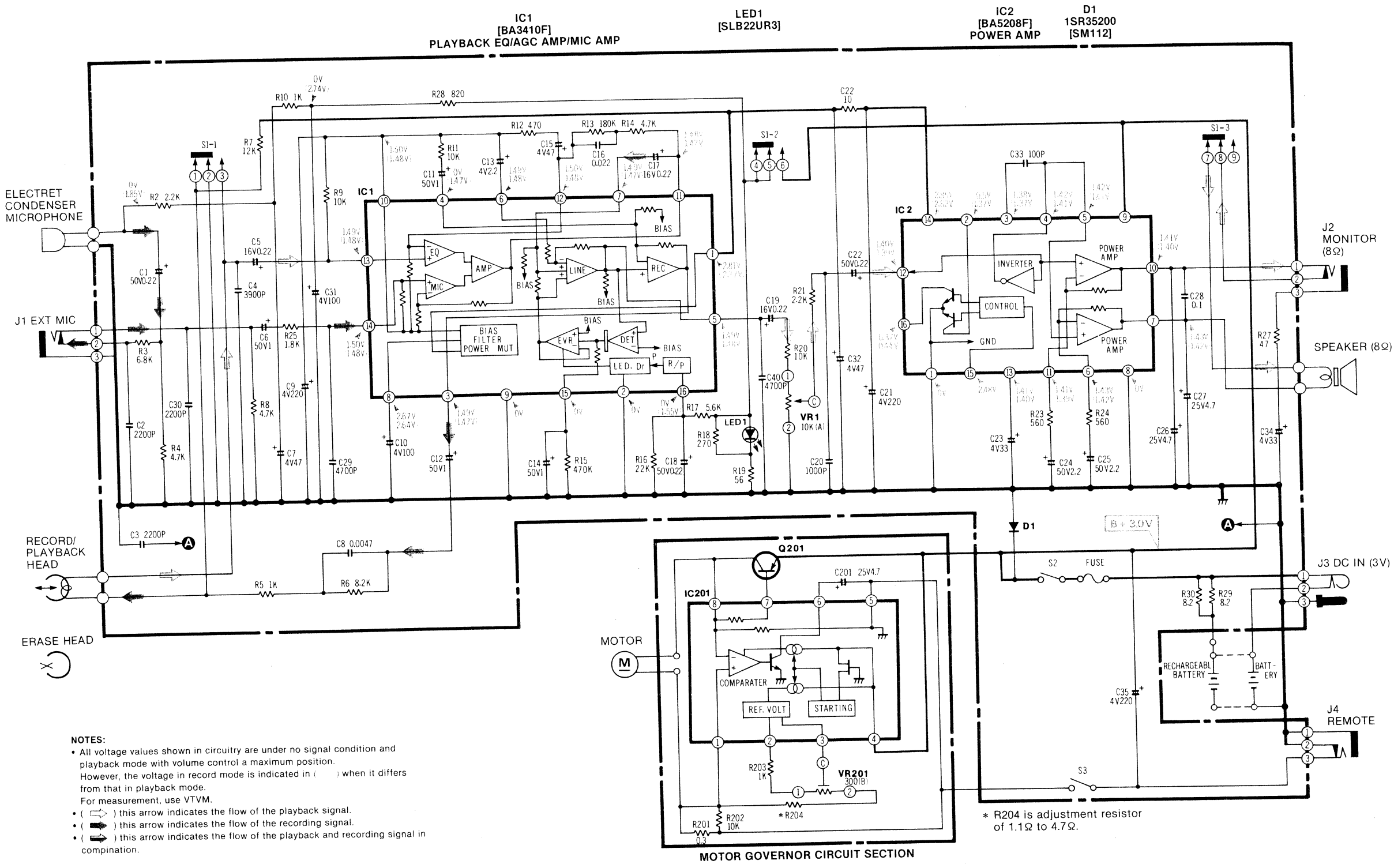
- The supply parts number is described alone in the replacement parts list.

- This schematic diagram may be modified at any time with the development of new technology.

SPECIFICATIONS

Standard recording input level	1kHz: MIC: -72dB \pm 4dB
Overall frequency response	250Hz: -3 \pm 5dB 1kHz: 0dB 6kHz: -3 \pm 6dB
Playback output level * Use test tape ...QZZCFM (315Hz, 0dB)	More than 1.6V
Notes: 1. Cut the speaker lead wire. 2. Connect 8 Ω instead of speaker.	

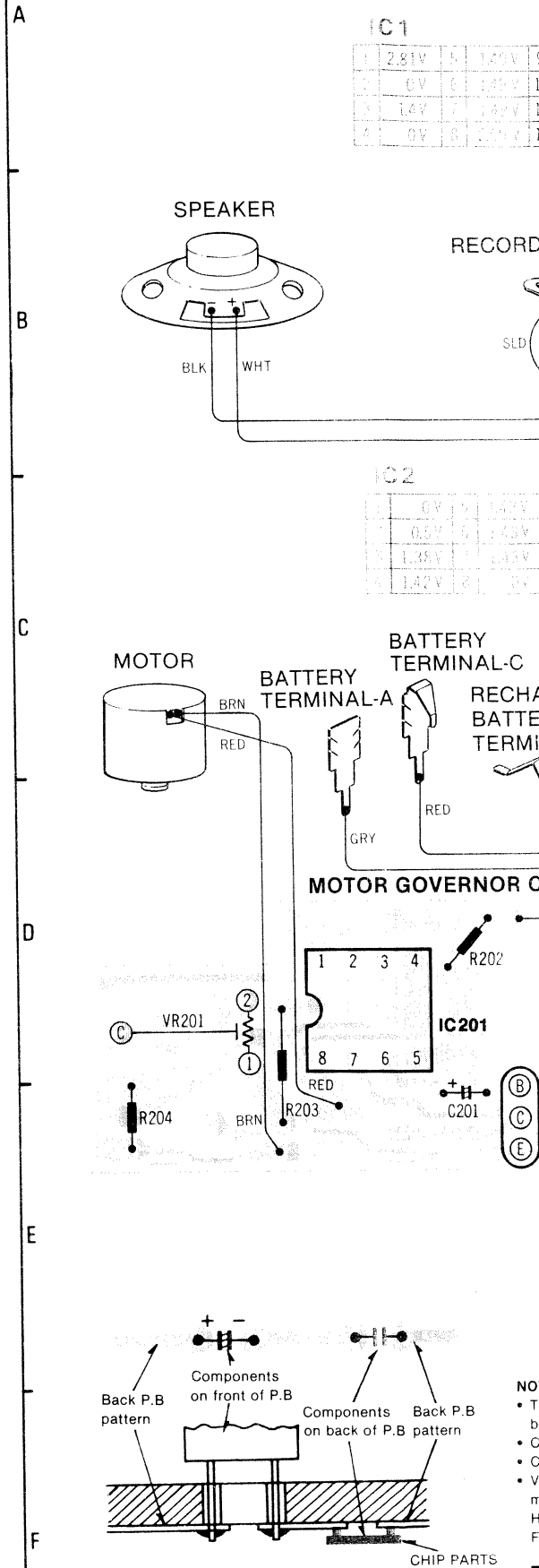
SCHEMATIC DIAGRAM

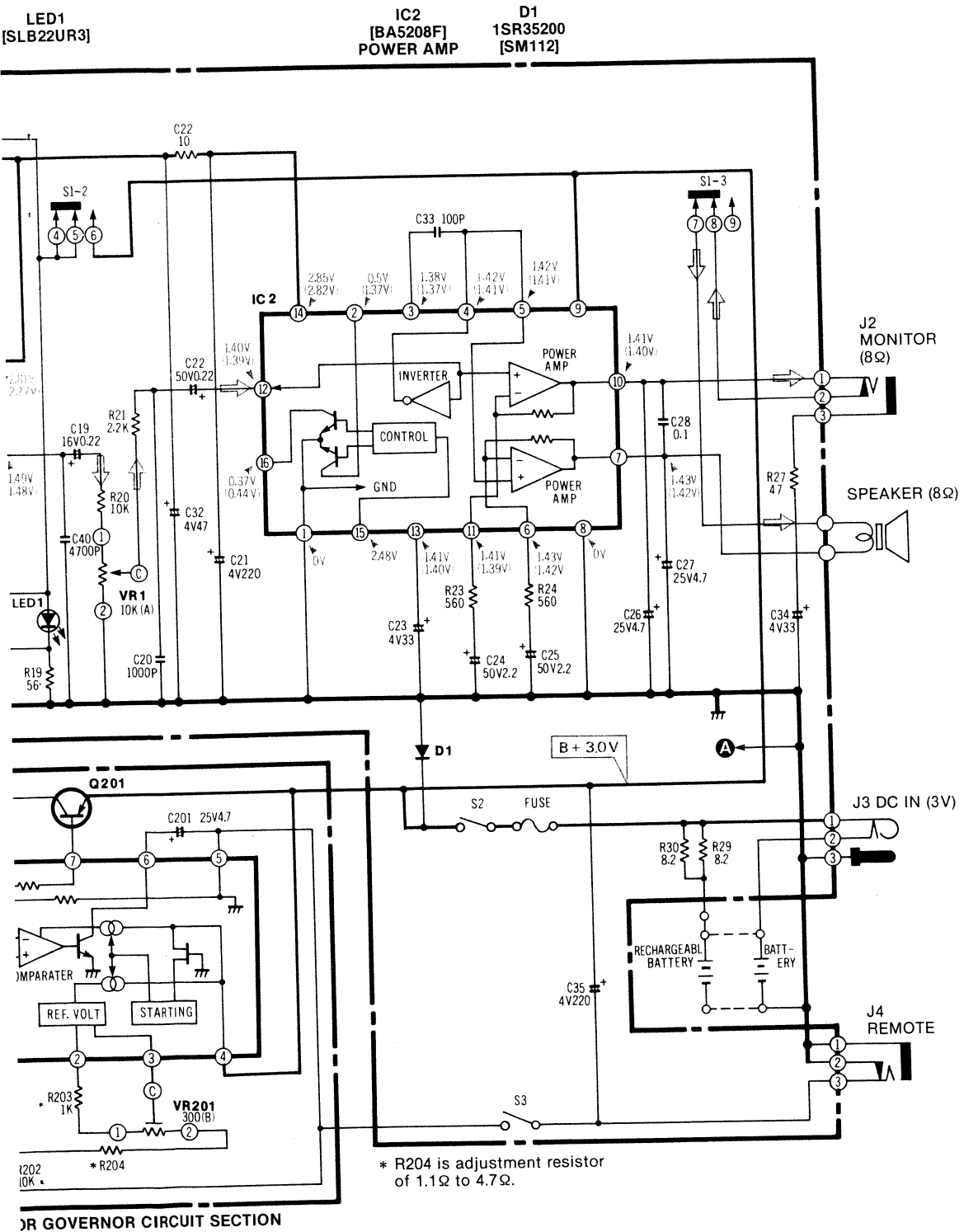


NOTES:

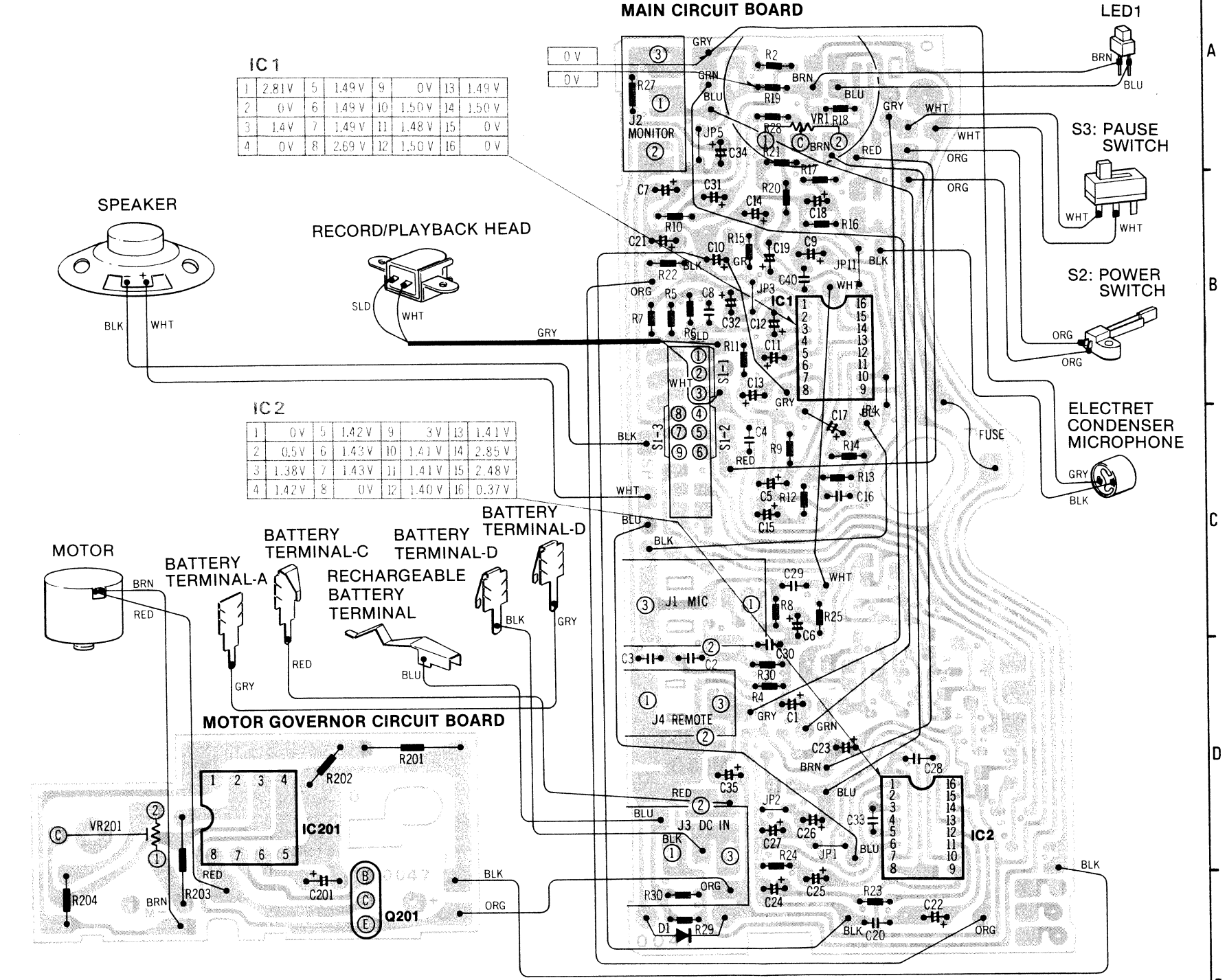
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control a maximum position. However, the voltage in record mode is indicated in () when it differs from that in playback mode. For measurement, use VTVM.
- (→) this arrow indicates the flow of the playback signal.
- (→) this arrow indicates the flow of the recording signal.
- (→) this arrow indicates the flow of the playback and recording signal in compination.

CIRCUIT BOARDS AND





CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



NOTES:

- This circuit shown in [] on the conductor indicates printed circuit on the back side of the printed circuit board (chip side).
- Components on front of P.B are identified by black symbols.
- Components on back of P.B are identified by red symbols.
- Values indicated in [] are under no signal condition and playback mode with volume control at maximum position.
- However, the voltage in record mode is indicated in () when it differs from that in playback mode.
- For measurement, use VTVM.
- This circuit board diagram may be modified at any time with the development of new technology.

TERMINATIONS

IC1, 2

D1

LED1

Chip Resistor

Chip Capacitor

Back P.B. pattern

Components on front of P.B.

Components on back of P.B. pattern

Back P.B.

CHIP PARTS

BLKBlack

BLUBlue

BRNBrown

GRYGray

GRNGreen

L. BLULight Blue

NILNo Color Mark

ORGOrange

PNKPink

REDRed

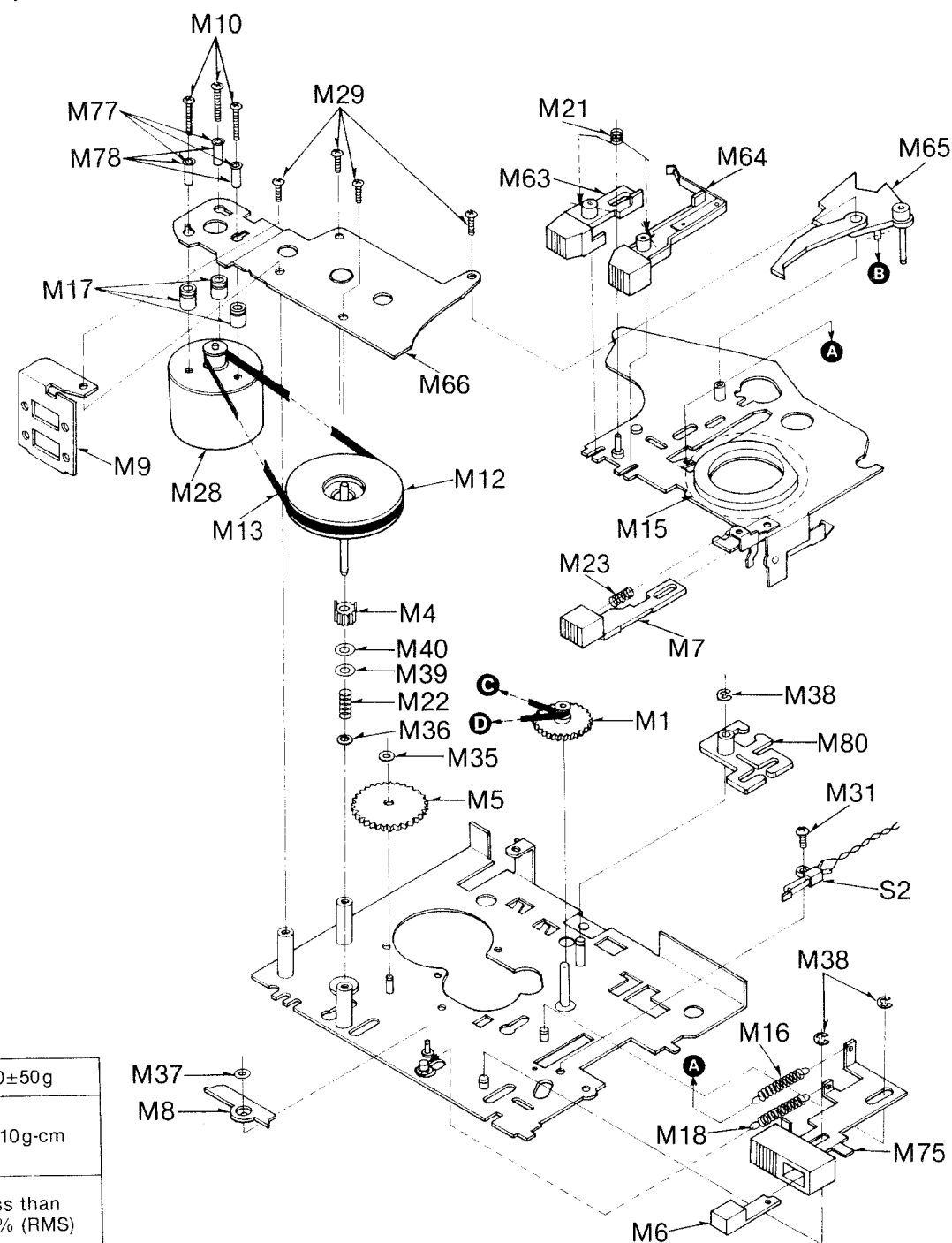
SLDShield Wire

VLTViolet

WHTWhite

YELYellow

(Front View)



Pressure of pressure roller	250±50g
Takeup tension * Use cassette torque meter.....QZZRKCT	40±10g-cm
Wow and flutter: JIS * Use test tapeQZZCWAT	Less than 0.48% (RMS)

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description						
MECHANICAL PARTS			M 14	XQN16C25F	Screw $\pm 1.6 \times 2.5$	M 30	XTNQ16C4D	Screw $\pm 1.6 \times 4$	M 44	ODG1319	Gear-(3)	M 58	QBW2008	Snap Washer	M 69	QXK2813	Erase Head Base Plate						
M 1	QDP1977	Supply Reel Table Assembly	M 15	QBMA0017	Speaker Cushion	M 31	XSN2+3	Screw $\pm 2 \times 3$	M 45	ODG1320	Gear-(4)	M 59	XUE35	Stop Ring 3.5 ϕ	M 70	QWY2158	Erase Head Assembly						
			M 16	QBT2104	Playback Rod Spring	M 32	XSN2+4	Screw $\pm 2 \times 4$	M 46	ODG1321	Gear-(5)	M 60	QXK2809	Intermediate Plate Assembly									
			M 17	QBG1762	Motor Rubber				M 47	QML4054	Auto-Stop Lever-A	M 60-1	QML4053	Eject Change Lever									
			M 18	QBT2012	Head Base Plate Spring				M 48	QML4055	Auto-Stop Lever-B												
			M 19	QBT2015	Erase Head Base Plate Spring				M 49	QML4060	Auto-Stop Safety Lever												
M 2	QML4051	Erase Safety Lever	M 20	QBN2014	Erase Safety Lever Spring	M 34	XWE347	Washer	M 50	QGA00024	Counter Adhesive Angle	M 60-2	QMG0127	Auto-Stop Lever Guide	M 74	QXG1080	Gear-(5) Assembly						
M 3	QTD1326	Head Wire Clamper				M 35	QBW2008	Snap Washer	M 51	QBT2013	Lock Plate Spring												
M 4	QDG1317	Gear-(1)				M 36	QBW2102	Washer	M 52	QBT2011	Switch Change Rod Spring			M 60-3	QXN16C3FZ	M 75	QXR0925						
M 5	QDG1318	Gear-(2)				M 37	QBW2030	Snap Washer															
M 6	QGQ2280	Record Button				M 38	XUC2	Stop Ring 2 ϕ															
M 7	QGQ2281	Stop Button	M 21	QBN2016	FF/REW Button Spring	M 39	QBW2013	Washer	M 53	QBN2015	FF Lever Spring	M 54	QBN2017	Eject Change Lever Spring	M 62	QXL1678	Reel Boss-(L) Assembly						
M 8	QML4059	Cue Lever	M 22	QBC1479	Flywheel Spring	M 40	QBKAA0006	Washer															
M 9	QMA6470	Motor Angle	M 23	QBC1477	Stop Button Spring	M 41	QXD0156	Takeup Reel Table Assembly							M 63	QXB7093	Gear Lever Assembly						
M 10	QHQ1358	Screw (for Motor)	M 24	QBN2013	Pressure Roller Spring											M 64	QXB7094						
			M 25	QBC1339	Head Adjustment Spring											M 65	QXL1679						
			M 27	QDC0165	Counter											M 66	QXK2814						
			M 28	HDN5A3RB	Motor	M 42	QXG1079	FF Gear Assembly								M 67	QXK2810						
			M 29	XQN16C3FZ	Screw $\pm 1.6 \times 3$	M 43	QMC0155	Spacer (for Gear-(4))															
M 11	QBP1519	Spring Washer	M 29	XQN16C3FZ	Screw $\pm 1.6 \times 3$	M 42	QXG1079	FF Gear Assembly	M 55	XUC2	Stop Ring 2 ϕ												

G 1 [DB] QYMA01970
[For all European a
[N] QYMA01939
[For Asia, Latin Am
areas.]
G 1-1 QBP2005
G 1-2 XTN2 + 6JF

G 2 [DB] QYMA01960
[For all European areas]
[N] QYMA0196H
[For Asia, Latin American
areas.]
G 2-1 QJB0161

G 2-2	QJB0109
G 2-3	QJB0142
G 2-4	QJB0147

G 3 [DB] QGPA00110
[For all European areas]
[N] QGPA0012
[For Asia, Latin America,
and other areas.]

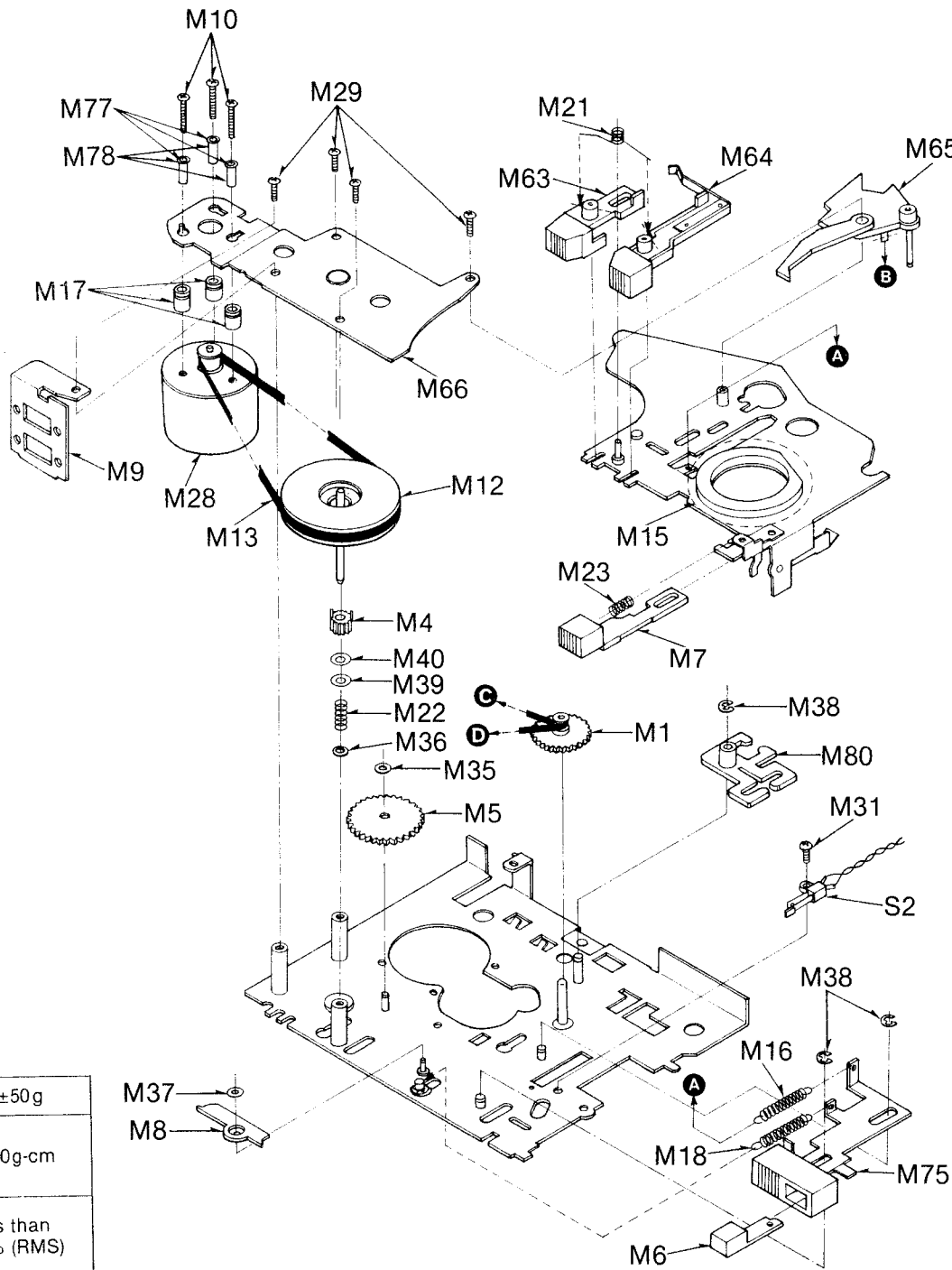
G 4 [DB] QKFA4005
[For all European
[N] QKFA4005
[For Asia, Latin Am
areas.]

G 5	QGO2284
G 6	QMN2859

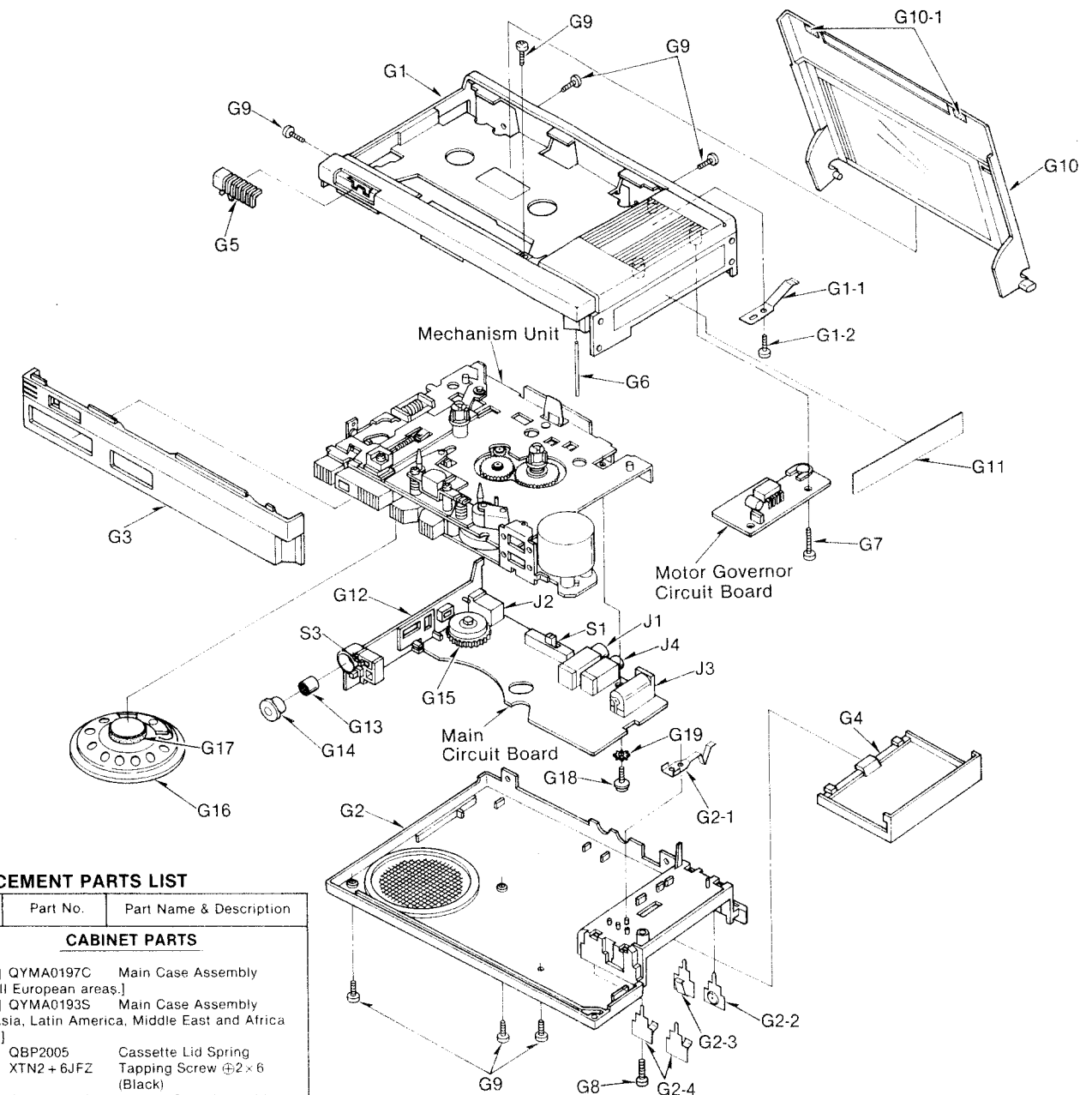
G 6	QMN2033
G 7	XTN2 + 6JF
G 8	XTN2 + 8JF

G 9 [DB] XQN16 + C
[For all European
[N] XQN16 + C
[For Asia, Latin A
areas.]

(Rear View)



CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description
CABINET PARTS		
G 1	[DB] QYMA0197C	Main Case Assembly [For all European areas.]
	[N] QYMA0193S	Main Case Assembly [For Asia, Latin America, Middle East and Africa areas.]
G 1-1	QBP2005	Cassette Lid Spring
G 1-2	XTN2 + 6JFZ	Tapping Screw $\Phi 2 \times 6$ (Black)
G 2	[DB] QYMA0196C	Bottom Case Assembly [For all European areas.]
	[N] QYMA0196H	Bottom Case Assembly [For Asia, Latin America, Middle East and Africa areas.]
G 2-1	QJB0161	Rechargeable Battery Terminal
G 2-2	QJB0109	Battery Terminal-A
G 2-3	QJB0142	Battery Terminal-C
G 2-4	QJB0147	Battery Terminal-D
G 3	[DB] QGPA0011C	Operation Panel [For all European areas.]
	[N] QGPA0012	Operation Panel [For Asia, Latin America, Middle East and Africa areas.]
G 4	[DB] QKFA4005C	Battery Lid [For all European areas.]
	[N] QKFA4005H	Battery Lid [For Asia, Latin America, Middle East and Africa areas.]
G 5	QGO2284	Pause Switch Button
G 6	QMN2859	Hand Strap Pin
G 7	XTN2 + 6JFR	Tapping Screw $\Phi 2 \times 6$ (Red)
G 8	XTN2 + 8JFZ	Tapping Screw $\Phi 2 \times 8$ (Black)
G 9	[DB] XQN16 + C4FZ	Screw $\Phi 1.6 \times 4$ (Black) [For all European areas.]
	[N] XQN16 + C4FN	Screw $\Phi 1.6 \times 4$ (Silver) [For Asia, Latin America, Middle East and Africa areas.]
M 69	QXK2813	Erase Head Base Plate Assembly
M 70	QWY2158	Erase Head
M 71	QMG0126	Erase Head Base
M 72	XSN2 + 8	Screw $\Phi 2 \times 8$
M 73	QXL1677	Pressure Roller Lever Assembly
M 74	QXG1080	Gear-(5) Assembly
M 75	QXR0925	Playback Rod Assembly
M 76	QXD0155	Reel Boss-(L) Assembly
M 77	QMF2324	Washer (for Motor)
M 78	QMC0157	Motor Collar
M 79	QDB0352	Counter Belt
M 80	QML4057	Record Lever
M 81	QBC1478	Back Tension Spring
M 82	QBC1474	Auto-Lever-A Spring

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
ACCESSORIES					
G 10	[DB] QYFA0045C	Cassette Lid Assembly [For all European areas.]	A 1	[N] QFTC07L003NZ	Demonstration Tape [For Asia, Latin America, Middle East and Africa areas.]
	[N] QYFA0045S	Cassette Lid Assembly [For Asia, Latin America, Middle East and Africa areas.]	A 2	QYH0102	Hand Strap Assembly
G 10-1	[DB] QBH2037	Spacer [For all European areas.]	A 3	[DB] QFKA0068	Carrying Bag [For all European areas.]
	[N] QBH2037H	Spacer [For Asia, Latin America, Middle East and Africa areas.]		[N] QFKA0067	Carrying Bag [For Asia, Latin America, Middle East and Africa areas.]
G 11	[DB] QGSA0093	Main Name Plate [For all European areas.]	A 4	[DB] QQT3518	Instruction Book [For all European areas.]
	[N] QGSA0090	Main Name Plate [For Asia, Latin America, Middle East and Africa areas.]		[N] QQT3500	Instruction Book [For Asia, Latin America, Middle East and Africa areas.]
G 12	[DB] QEJA0027	Jack Plate Assembly [For all European areas.]	PACKINGS		
	[N] QEJA0026	Jack Plate Assembly [For Asia, Latin America, Middle East and Africa areas.]	P 1	[DB] QPNA0181	Inner Carton [For all European areas.]
G 13	WM063Y110	Electret Condenser Microphone		[N] QPNA0176	Inner Carton [For Asia, Latin America, Middle East and Africa areas.]
G 14	QBG1733	Microphone Rubber	P 2	XZB16X27A02	Poly Bag (for UNIT)
G 15	QGT1483F	Volume Knob	P 3	QPAA0093	Cushion
G 16	EAS65P106SE	Speaker	P 4	QPSA0036	Pad
G 17	QVWA0009	Insulator Sheet			
G 18	XQNOC16A4F	Screw $\Phi 1.6 \times 4$			
G 19	XWC2B	Washer 2ϕ			

Parts Change Notice

Model No. RQ-352 [D, B, N]

Please revise the original parts list in the Service Manual to conform to the change (s) shown below. If new part numbers are shown, be sure to use them when ordering parts.

Reason for Change		*The circled item indicates the reason. If no marking, see the Notes in the bottom column.					
1.	Improve performance						
2.	Change of material or dimension						
3.	To meet approved specification						
4.	Standardization						
5.	Addition						
6.	Deletion						
⑦.	Correction						
8.	Other						
Interchangeability Code		**The circled item indicates the interchangeability. If no marking, see the Notes in the bottom column.					
Parts		Unit Production					
A	Original	→	Early	Original or new parts may be used in either early or late production units. Use original parts until the supply is exhausted, then stock new parts.			
	New	→	Late				
B	Original	→	Early	Original parts may be used in early production units only. New parts may be used in either or late production units. Use original parts where possible, then stock new parts.			
	New	→	Late				
C	Original	→	Early	New parts are to be used in both early and late production units. Stock new parts only.			
	New	→	Late				
D	Original	→	Early	Original parts must be used in early production units. New parts must be used in late production units only. Stock both original and new parts.			
	New	→	Late				
⑤	Other						
Part Number Information							
Model No.	Ref. No.	Original Part No.	New Part No.	Notes(*, **)	Part Name & Description	Q'ty	
	G16	EAS65P106SE	EAS45P106SE	7, E	SPEAKER	1	

Please file this parts change notice with your copy of the Service Manual for model No. RQ-352, Order No. ARD83060259C8-05.

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